

28. (New) The composition of claim 27 wherein said HCV NS3 domain protease or active HCV NS3 domain truncation analog has a partial internal amino acid sequence of SEQ ID No: 63.

29. (New) The composition of claim 27 wherein said HCV NS3 domain protease or active HCV NS3 domain truncation analog has a partial internal amino acid sequence of SEQ ID No: 64.

30. (New) The composition of claim 27 wherein said HCV NS3 domain protease or active HCV NS3 domain truncation analog has a partial internal amino acid sequence of SEQ ID No: 65.

31. (New) A composition comprising a purified proteolytic hepatitis C virus (HCV) polypeptide wherein said HCV polypeptide comprises a fusion protein comprising a fusion partner fused to a HCV NS3 domain protease or to an active HCV NS3 domain protease truncation analog.

32. (New) The composition of claim 31, wherein said fusion partner comprises human superoxide dismutase.

33. (New) The composition of claim 31 wherein said HCV NS3 domain protease or active HCV NS3 domain protease truncation analog has a partial internal amino acid sequence comprising SEQ ID No: 63.

34. (New) The composition of claim 31 wherein said HCV NS3 domain protease or active HCV NS3 domain protease truncation analog has a partial internal amino acid sequence comprising SEQ ID No: 64.

35. (New) The composition of claim 31 wherein said HCV NS3 domain protease or active HCV NS3 domain protease truncation analog has a partial internal amino acid sequence comprising SEQ ID No: 65.

36. (New) A method for assaying compounds for activity against hepatitis C virus comprising the steps of:

WHAT IS CLAIMED:

1. A composition comprising a purified proteolytic polypeptide derived from Hepatitis C virus.

2. The composition of claim 1, wherein said polypeptide has a partial internal sequence substantially as follows:

...Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr...

3. The composition of claim 1, wherein said polypeptide has a partial internal sequence substantially as follows:

...Leu Lys Gly Ser Ser Gly Gly Pro Leu...

4. The composition of claim 2, wherein said polypeptide has substantially the partial internal sequence:

Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly  
Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu  
Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu  
Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys Ile Asn Gly  
Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys  
Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro  
Ala Pro Gln Gly Ser Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu  
Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser  
Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly  
Gly Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Arg Ala Ala Val  
Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn Leu Glu  
Thr Thr Met Arg.

5. The composition of claim 1, wherein said polypeptide has substantially the amino acid sequence shown in Figure 1.

5            7.            The fusion protein of claim 6, wherein said fusion partner comprises human superoxide dismutase.

10                   ...Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr...

...Leu Lys Gly Ser Ser Gly Gly Pro Leu...

Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser  
Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr  
Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys  
Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe  
Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala  
Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr  
Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly Ser Arg  
Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr  
Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly  
Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly  
Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Arg Ala Ala Val  
Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn  
Leu Glu Thr Thr Met Arg.

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12. A composition comprising a polynucleotide which encodes only the HCV protease or an active HCV protease analog.

13. The composition of claim 12, wherein said polynucleotide encodes  
5 the HCV protease of Figure 1.

14. A composition comprising a polynucleotide which encodes a fusion  
protein comprising:  
HCV protease or HCV protease analog; and  
10 a fusion partner.

15. The composition of claim 14, wherein said fusion partner is selected  
from the group consisting of hSOD, yeast  $\alpha$ -factor, IL-2S, ubiquitin,  $\beta$ -galactosidase,  
 $\beta$ -lactamase, horseradish peroxidase, glucose oxidase, and urease.

16. The composition of claim 14, wherein said HCV protease or HCV  
protease analog comprises a polypeptide having substantially the following sequence:

Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser  
Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr  
20 Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys  
Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe  
Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala  
Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr  
Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly Ser Arg  
25 Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr  
Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly  
Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly  
Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Arg Ala Ala Val  
Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn  
30 Leu Glu Thr Thr Met Arg.

17. The composition of claim 14, wherein said HCV protease or analog comprises a polypeptide having substantially the sequence:

5 Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala His  
Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe Ser  
Gln Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys  
Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile  
Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu Leu  
Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile  
10 Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val  
Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys Ile Ile Asn  
Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr Ile Ala Ser  
Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp Gln Asp Leu  
Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu Thr Pro Cys Thr  
Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile  
15 Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg  
Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ala  
Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val  
Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn Leu Glu Thr Thr Met  
Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro Pro Val Val Pro Gln Ser  
20 Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys  
Val Pro Ala Ala.

18. The composition of claim 14, wherein said polypeptide has substantially the sequence:

25 Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala His  
Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe Ser  
Gln Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys  
Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile  
Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu Leu  
30 Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile  
Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val  
Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys Ile Ile Asn  
Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr Ile Ala Ser  
Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp Gln Asp Leu  
35 Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu Thr Pro Cys Thr  
Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile  
Pro Val Arg.

19. A method for assaying compounds for activity against hepatitis C virus, comprising:  
providing an active hepatitis C virus protease;  
contacting said protease with a compound capable of inhibiting serine protease  
5 activity; and  
measuring inhibition of the proteolytic activity of said hepatitis C virus protease.

20. An expression vector for producing HCV protease or HCV protease  
10 analogs in a host cell, which vector comprises:  
a polynucleotide encoding HCV protease or an HCV analog;  
transcriptional and translational regulatory sequences functional in said host cell  
operably linked to said HCV protease-encoding polynucleotide; and  
a selectable marker.

21. The vector of claim 20, which further comprises a sequence encoding  
15 a fusion partner, linked to said HCV protease-encoding polynucleotide to form a fusion protein upon expression.

22. The vector of claim 21, wherein said fusion partner is selected from  
20 the group consisting of hSOD, yeast  $\alpha$ -factor, IL-2S, ubiquitin,  $\beta$ -galactosidase,  $\beta$ -lactamase, horseradish peroxidase, glucose oxidase, and urease.

23. The vector of claim 22, wherein said fusion partner is selected from  
25 the group consisting of ubiquitin, hSOD, and yeast  $\alpha$ -factor.

24. The vector of claim 20, wherein said HCV protease-encoding polynucleotide encodes a polypeptide having the substantially the following sequence:

Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser  
Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr  
Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys  
Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe  
5 Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala  
Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr  
Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly Ser Arg  
Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr  
Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly  
10 Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly  
Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Arg Ala Ala Val  
Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn  
Leu Glu Thr Thr Met Arg.

15            25.        The vector of claim 20, wherein said HCV protease-encoding polynucleotide encodes a polypeptide having the substantially the following sequence:

20 Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala His  
Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe Ser  
Gln Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys  
25 Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile  
Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu Leu  
Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile  
Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val  
Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys Ile Ile Asn  
25 Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr Ile Ala Ser  
Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp Gln Asp Leu  
Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu Thr Pro Cys Thr  
Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile  
Pro Val Arg.

26. The vector of claim 20, wherein said HCV protease-encoding polynucleotide encodes a polypeptide having the substantially the following sequence:

35 Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala His  
Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe Ser  
Gln Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys  
Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile  
Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu Leu

1. *Chrysomelidae* (Colorado potato beetle)  
 2. *Curculionidae* (Colorado potato beetle)  
 3. *Curculionidae* (Colorado potato beetle)  
 4. *Curculionidae* (Colorado potato beetle)  
 5. *Curculionidae* (Colorado potato beetle)  
 6. *Curculionidae* (Colorado potato beetle)  
 7. *Curculionidae* (Colorado potato beetle)  
 8. *Curculionidae* (Colorado potato beetle)  
 9. *Curculionidae* (Colorado potato beetle)  
 10. *Curculionidae* (Colorado potato beetle)

Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile  
Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val  
Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys Ile Ile Asn  
Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr Ile Ala Ser  
5 Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp Gln Asp Leu  
Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu Thr Pro Cys Thr  
Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile  
Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg  
Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ala  
10 Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val  
Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn Leu Glu Thr Thr Met  
Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro Pro Val Val Pro Gln Ser  
Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys  
Val Pro Ala Ala.

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